**CLAIMS:**

1. A lithium ion battery comprising:

a cathode;

an anode; and

an electrolyte layer formed between the cathode and the anode,

wherein the cathode, the anode, and the electrolyte layer constitute a cell element, and

wherein the electrolyte layer comprises an arrangement of insulating particles with a plurality of interstitial spaces therebetween, with electrolytes occupying at least some of the interstitial spaces.

2. A battery according to claim 1, wherein the insulating particles are placed between the cathode and the anode so that the facing sides of the cathode and the anode do not contact each other.

3. A battery according to claim 1, wherein a void ratio of the interstitial spaces to the insulating particles in the electrolyte layer is 50–90%.

4. A battery according to claim 1, wherein a mean radius of the insulating particles is 0.05–10 μm.

5. A battery according to claim 1, wherein a thickness of the electrolyte layer is 10 μm or less.

6. A battery according to claim 1, wherein the electrolyte layer is a solid electrolyte layer.

7. A battery according to claim 1, wherein the insulating particles comprise olefin resins.

8. A battery according to claim 1, wherein the insulating particles are inorganic oxides.

9. A battery according to claim 1, wherein the cathode comprises a cathode active material that is formed using lithium-transition metal composite oxides, and wherein the anode comprises an anode active material that is formed using carbon- or lithium-transition metal composite oxides.

10. A method for manufacturing a battery comprising:

applying insulating particles and an electrolytic polymer to form an electrolyte layer, wherein the electrolytic polymer occupies at least some of a plurality of interstitial spaces between the insulating particles; and

layering the electrolyte layer between a cathode and an anode, wherein the cathode and the anode are facing each other.

11. The method according to claim 10, wherein the electrolyte layer is formed by applying the insulating particles and the electrolytic polymer through a nozzle of an ink-jet printer.

12. The method according to claim 10, wherein the insulating particles and electrolytic polymer are applied simultaneously to form a solid electrolyte battery.

13. The method according to claim 10, wherein the insulating particles and electrolytic polymer are applied separately to form a solid electrolyte battery.

14. The method according to claim 10, wherein the thickness of the electrolyte layer is 10 μm or less.

15. A battery assembly comprising multiple connected batteries, wherein each of the connected batteries comprises:

layered cell elements including a cathode and an anode that are facing each other; and

an electrolyte layer between the cathode and the anode,

wherein lithium ions can be inserted into and removed from the cathode and the anode through the electrolyte layer,

wherein the electrolyte layer comprises insulating particles and electrolytes, and

wherein the electrolytes occupy at least some of a plurality of interstitial spaces between the insulating particles.

16. A vehicle having a battery assembly comprising multiple connected batteries mounted as a power supply for a drive train of the vehicle, wherein each of the connected batteries comprises:

layered cell elements including a cathode and an anode that are facing each other; and an electrolyte layer between the cathode and the anode,

wherein lithium ions can be inserted into and removed from the cathode and the anode through the electrolyte layer, and

wherein the electrolyte layer comprises insulating particles and electrolytes positioned such that the electrolytes occupy at least some of a plurality of interstitial spaces between the insulating particles.

17. A method of manufacturing a lithium ion battery comprising:

applying insulating particles on a substrate with a first coating means;

applying an electrolytic polymer in at least some of a plurality of interstitial spaces between the insulating particles with a second coating means to form an electrolyte layer; and

layering the electrolyte layer between a cathode and an anode.

18. The method of claim 17, wherein the cathode and the anode are facing each other.

19. The method of claim 18, wherein lithium ions can be inserted into and removed from the cathode and the anode through the electrolyte layer.